REMARKS

Claim Rejections 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 22-24 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claims 22-24 are dependent on claim 1. Applicants have amended claim 1 and claims 22-24 to distinguish between a first set of electrons and a second set of electrons. Support is provided at lines 13-14 on page 12 and lines 23-24 on page 13 of the specification. Thus, Applicants have particularly pointed out and distinctly claimed the subject matter which Applicants regard as the invention.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 22-24 under 35 U.S.C. §112, second paragraph.

Claim Rejections 35 U.S.C. § 102 (b)

Claims 1-12, 18, and 20

The Examiner has rejected claims 1-12, 18, and 20 as being anticipated by Casey, Jr. et al. (US 6,042,738) as demonstrated by Baum et al. (US 5,684,360).

Applicants respectfully disagree with the Examiner. Claims 2-3 have been previously canceled without prejudice. Applicants have amended claims 1, 5, 7, 9-12, 18, and 20. Support is provided at lines 13-14 on page 12 and lines 23-24 on page 13 of the specification.

Claim 1, as amended, of Applicants' claimed invention, claims an apparatus (400) including: a holder (420) to mount a substrate (410); a stage (430) to position the holder in a chamber (470); an imaging system (440) to locate an opaque defect (405) on the substrate, the imaging system including a first electron column, the first electron column to direct a first set of electrons towards the opaque defect; a gas delivery system (450) to dispense a reactant gas towards the opaque defect; and an electron delivery system (460) to induce chemical etching of the opaque defect by the reactant gas, the electron delivery system including a second electron column, the second electron column to direct a second set of electrons towards the opaque defect. See Figure 4. Also, see pages 12-14 of the specification.

In contrast, Casey, Jr. et al. teaches a focused ion beam (FIB) system (10) that includes an ion column (12), a vacuum chamber (22), a stage (24), a platform (26), a workpiece (30), a reactant material delivery system (34), a secondary particle detector (28), and a charge neutralization element (32). See Figure 1. Also, see Col. 4, lines 28-34.

Baum et al. teaches a main electron beam column (60) that includes a vacuum enclosure (62), an electron beam (30), electron optics (66), and a workpiece (64). See Figure 1. Also, see Col. 6, lines 29-33.

In the opinion of the Examiner, the teachings of Baum et al. result in the secondary particle detector (28) of Casey, Jr. et al. being considered to be equivalent to a first electron column. See section (iv.) of item (5.) on page 3 of the Office action dated June 17, 2004. Furthermore, in the opinion of the Examiner, the teachings of Baum et al. also result in the charge neutralization element (32) of Casey, Jr. et al. being considered to be equivalent to a second electron column. See section (vi.) of item (5.) on page 3 of the Office action dated June 17, 2004.

The interpretations of the Examiner are not justified by a careful reading of both cited references. Neither the secondary particle detector (28) nor the charge neutralization element (32) of Casey, Jr. et al. includes electron optics so neither may be considered to be a main electron beam column as taught by Baum et al. Since the Casey, Jr. et al. reference cited by the Examiner does not teach each and every

element of Applicants' invention, Casey, Jr. et al. does not anticipate Applicants' invention, as claimed in claim 1, as amended. Since the Baum et al. reference cited by the Examiner does not teach each and every element of Applicants' invention, Baum et al. does not anticipate Applicants' invention, as claimed in claim 1, as amended.

Claims 4-12, 18, and 20 are dependent on claim 1. Since neither Casey, Jr. et al. nor Baum et al. teaches each and every element of Applicants' invention, as claimed in claim 1, as amended, neither Casey, Jr. et al. nor Baum et al. anticipates Applicants' invention, as claimed in claims 4-12, 18, and 20.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 1, 4-12, 18, and 20 under 35 U.S.C. § 102 (b).

Claim Rejections 35 U.S.C. § 103 (a)

Claim 19

The Examiner has rejected claim 19 under 35 U.S.C. §103 (a) as being unpatentable over Casey, Jr. et al. (US 6,042,738) in view of Fuji et al. (US 5,876,504).

Applicants respectfully disagree with the Examiner. Claim 19 is dependent on claim 1. Applicants have amended claims 1 and 19. Support is provided at lines 13-14 on page 12 and lines 23-24 on page 13 of the specification.

Claim 1, as amended, of Applicants' claimed invention, claims an apparatus (400) including: a holder (420) to mount a substrate (410); a stage (430) to position the holder in a chamber (470); an imaging system (440) to locate an opaque defect (405) on the substrate, the imaging system including a first electron column, the first electron column to direct a first set of electrons towards the opaque defect; a gas delivery system (450) to dispense a reactant gas towards the opaque defect; and an electron delivery system (460) to induce chemical etching of the opaque defect by the

reactant gas, the electron delivery system including a second electron column, the second electron column to direct a second set of electrons towards the opaque defect. See Figure 4. Also, see pages 12-14 of the specification.

In contrast, Casey, Jr. et al. teaches a focused ion beam (FIB) system (10) that includes an ion column (12), a vacuum chamber (22), a stage (24), a platform (26), a workpiece (30), a reactant material delivery system (34), a secondary particle detector (28), and a charge neutralization element (32). See Figure 1. Also, see Col. 4, lines 28-34.

Fuji et al. teaches a chemical vapor deposition apparatus that includes a material gas supplier (8) disposed at a predetermined tilt angle, theta, with respect to a rotatable substrate holder (4) in a plasma electric discharge area (7) in a low-pressure reaction chamber (1). See Figure 2. Also, see Col. 4, lines 35-37.

However, despite the assertions of the Examiner, combination of the apparatus of Casey, Jr. et al. with the material gas supplier of Fuji et al., even if possible, would still not produce the apparatus claimed in claim 19 of Applicants' claimed invention. Consequently, Applicants' claimed invention, as claimed in claim 19, would not have been obvious to one of ordinary skill in the art of semiconductors at the time the invention was made.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claim 19 under 35 U.S.C. §103 (a).

Claims 21-24

The Examiner has rejected claims 21-24 under 35 U.S.C. §103 (a) as being unpatentable over Casey, Jr. et al. (US 6,042,738) in view of Hashimoto (US 6,042,738).

Applicants respectfully disagree with the Examiner. Claims 21-24 are dependent on claim 1. Applicants have amended claims 1 and 22-24. Support is provided at lines 13-14 on page 12 and lines 23-24 on page 13 of the specification.

Claim 1, as amended, of Applicants' claimed invention, claims an apparatus (400) including: a holder (420) to mount a substrate (410); a stage (430) to position the holder in a chamber (470); an imaging system (440) to locate an opaque defect (405) on the substrate, the imaging system including a first electron column, the first electron column to direct a first set of electrons towards the opaque defect; a gas delivery system (450) to dispense a reactant gas towards the opaque defect; and an electron delivery system (460) to induce chemical etching of the opaque defect by the reactant gas, the electron delivery system including a second electron column, the second electron column to direct a second set of electrons towards the opaque defect. See Figure 4. Also, see pages 12-14 of the specification.

In contrast, Casey, Jr. et al. teaches a focused ion beam (FIB) system (10) that includes an ion column (12), a vacuum chamber (22), a stage (24), a platform (26), a workpiece (30), a reactant material delivery system (34), a secondary particle detector (28), and a charge neutralization element (32). See Figure 1. Also, see Col. 4, lines 28-34.

Hashimoto teaches preparation of a specimen (15) of thin film of a material having a crystal structure on a specimen stage (14) in a vacuum container (32) and irradiation with a primary electron beam (16) having a size of about 200 nanometers (nm) if a field emission electron gun (12) is used with an acceleration voltage of 1 kilo electron Volt (keV) and an emission current of 1 nano Ampere (nA). See Figure 7. Also, see Col. 6, lines 30-38. Further, see Col. 7, lines 1-7.

However, despite the assertions of the Examiner, combination of the apparatus of Casey, Jr. et al. with the electron gun of Hashimoto, even if possible, would still not produce the apparatus claimed in claims 21-24 of Applicants' claimed invention. Consequently, Applicants' claimed invention, as claimed in claims 21-24, would not have been obvious to one of ordinary skill in the art of semiconductors at the time the invention was made.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 21-24 under 35 U.S.C. §103 (a).

Conclusion

Applicants believe that all claims pending, including new claims 25-33, are now in condition for allowance so such action is earnestly solicited at the earliest possible date.